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*** NOTICE ***

| APPLICATION NO. | FILING DATE | FIRST NAME INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09 773,798 | 02/01/2001 | Douglas Duane Coolbaugh | BUR920000143L S1013890 | 8546 |

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EXAMINER

FARAHANI, DANA

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 12/19/2001

Please find below and or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/773.798

Applicant(s)

COOLBAUGH ET AL

Examiner

Dana Farahani

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 01 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other _____

Drawings

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Pinter (U.S. 6,169,007).

Pinter discloses, figures 11-13, a method of improving the SiGe bipolar yield of a SiGe heterojunction bipolar transistor comprising the steps of forming a passivation layer 47 on at least exposed sidewalls of an emitter 64, the emitter is in contact with an underlying SiGe base region 54 through an emitter opening formed in an insulator layer 58; and siliciding exposed silicon surfaces so as to form silicide regions 58, 38, and 36.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 9, 10, 12, 13, 14, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Jalali-Farahani et al. (U.S. 5,620,907).

Regarding claims 9, 10, 13, and 14, Jalali-Farahani discloses, figure 1, a SiGe heterojunction bipolar transistor comprising a silicon substrate (not shown) having a collector 20 and sub-collector region 10 formed therein, wherein the collector is formed between isolation regions 30 that are also present in the substrate; a SiGe layer 60 formed on the substrate, the SiGe layer including polycrystalline Si regions 70 formed above the isolation regions; a patterned insulator layer 100 formed on the SiGe base region and it has an opening therein; an emitter 80, 90, and 110 formed on the patterned insulator layer and in contact with the SiGe base region through the opening, the emitter region having exposed sidewalls; a conformal passivation layer 120, 130, and 170 formed on at least the exposed sidewalls of the emitter and patterned insulator and portions of the SiGe base region; and silicide regions 130 formed on exposed portions of the SiGe layer and the emitter not covered by the passivation layer.

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Regarding claim 12, Jalali-Farahani discloses, column 4, line 2, the patterned insulator layer is silicon dioxide.

Regarding claim 15, Jalali-Farahani discloses, figure 1, the silicide regions 130 are formed in an exposed horizontal surface of the emitter 90, the polycrystalline Si region 70, and a portion of the SiGe base region 60.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinter as applied to claim 1 above, and further in view of Halliyal et al. (U.S. 6,319,755).

Pinter discloses the claimed invention except Rapid Thermal Chemical Vapor Deposition (RTCVD) process is used in a nitrogen-containing atmosphere to form various layers of the heterojunction bipolar transistor. Halliyal discloses column 5, lines 12-30 and 47, RTCVD process is used in a nitrogen-containing atmosphere at about 700 degrees. Furthermore, Halliyal discloses the use of this method prevents contamination of other layers (see column 6, lines 1-5). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention to use this method to form the base and passivation layer so there would be no contamination in the layers interface.

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8. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinter as applied to claim 1 above, and further in view of Rhodes (U.S. 6,326,652).

Pinter discloses the claimed invention except the passivation layer is composed of a nitride, an oxide, and an oxy-nitride layer. Rhodes discloses, column 10, lines 40-42, passivation layers could be formed of these materials. Therefore, It would have been obvious to one of ordinary skill in the art at the time of invention to use these well-known materials in order to isolate the emitter region.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jalali-Farahani as applied to claims 9, 10, 12, 13, 14, and 15 above, and further in view of Sedra and Smith. Jalali-Farahani discloses the claimed invention except the emitter is composed of intrinsic polysilicon. It would have been obvious to one of ordinary skill in the art at the time of the invention to use intrinsic polysilicon since it was known in the art that intrinsic polysilicon has more accurate resistor ratios (see Sedra and Smith, page A-8, first paragraph).

10. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jalali-Farahani as applied to claims 9, 10, 12, 13, 14, and 15 above, and further in view of Rhodes. Jalali-Farahani discloses the claimed invention except the passivation layer is composed of a nitride, an oxide, and an oxy-nitride layer. Rhodes discloses, column 10, lines 40-42, passivation layers could be formed of these materials.

Therefore, It would have been obvious to one of ordinary skill in the art at the time of invention to use these well-known materials in order to isolate the emitter region.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3432 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani
December 14, 2001

Dana Farahani
December 14, 2001